Spot Safety Project Evaluation

Project Log # 200505122

Spot Safety Project # 06-99-207

Spot Safety Project Evaluation of the Guardrail installation along the east shoulder of US 401 at Valencia Drive in the vicinity of the Korean Catholic Community Church in Cumberland Co.

Documents Prepared By:

Safety Evaluation Group
Traffic Safety Systems Management Section
Traffic Engineering and Safety Systems Branch
North Carolina Department of Transportation

Principal Investigator

Samuel D. Coleman, EI

Traffic Safety Project Engineer

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Date

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 06-99-207 - The Guardrail installation along the east shoulder of US 401 at Valencia Drive in the vicinity of the Korean Catholic Community Church in Cumberland Co.

Introduction

In an attempt to assess the safety of our roads, the Safety Evaluation Group of the Traffic Safety Systems Management Section has evaluated the above project. The methodologies used in this evaluation offer various philosophies and ideas, in an effort to provide objective countermeasure crash reduction results. A naive before and after analysis of the treatment data has been completed to measure the effectiveness of the spot safety improvement. Additional analysis methods were not utilized for this evaluation because a suitable comparison group was unattainable. This information is provided to you so the benefit or lack of benefit for this type of project can be recognized and utilized for future projects.

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was the installation of guardrail along the east shoulder of US 401 from Nutley Drive toward Van Buren Avenue. US 401 is a four-lane, 50-mph facility with a center left turn lane. The initial crash analysis for this intersection was completed from March 1, 1996 to February 28, 1999. There were a total of 5 crashes including 2 run off road crashes which resulted in 1 Class A and 1 Class B injury. The stated reason for this improvement was to alleviate a pattern and reduce the severity of ran off road type crashes at a 275ft embankment. At the bottom of the embankment lie a utility pole, trees, and a church. The final completion date for the guardrail installation along the subject road was on June 30, 2000 at a cost of $20,000.

Naive Before and After Analysis

After reviewing the spot safety project file folder along with all the crashes along the subject road, the crash data omitted from this analysis to consider for an adequate construction period was from May 2000 through July 2000. The before period consisted of reported crashes from December 1, 1995 through April 30, 2000 (4 years, 5 Months) and the after period consisted of reported crashes from August 1, 2000 through December 31, 2004 (4 Years, 5 Months). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed. The analysis consisted of the treatment data along US 401 from Nutley Drive (MP 10.65) to Van Buren Avenue (MP 10.93) with a 0’ y-line.

The following data table depicts the Naive Before and After Analysis for the above information. Please note that Ran Off Road Crashes were the target crashes for the applied countermeasure. These crash types considered are as follows: Ran Off Road-Left, Ran Off Road-Right, Ran Off Road-Straight, Overturn/Rollover, Fixed Object, Head-On; Sideswipe, Same Direction; Sideswipe, Opposite Direction.

Treatment Information			
	Before	**After**	**Percent Reduction (-) Percent Increase (+)**
Total crashes	19	28	47.4
Total Severity Index	8.5	6.9	-19.0
Target Crashes	12	17	41.7
Target Severity Index	11.0	8.1	-26.6
Volume	29000	33000	13.8
Treatment Injury Information			
	Before	**After**	**Percent Reduction (-) Percent Increase (+)**
Fatal	0	0	0.0
Class A	1	1	0.0
Class B	5	4	-20.0
Class C	4	8	100.0
Property Damage Only	9	15	66.7
Target Injury Information			
	Before	**After**	**Percent Reduction (-) Percent Increase (+)**
Fatal	0	0	0.0
Class A	1	1	0.0
Class B	4	3	-25.0
Class C	2	3	50.0
Property Damage Only	5	10	100.0
Crashes over embankment	6	0	-100.0
Crashes into guardrail	1	11	1000.0

Table 1.

The naive before and after analysis at the treatment location resulted in a 47.4 percent increase in Total Crashes, a 41.7 percent increase in Target Crashes, and a 13.8 percent decrease in Average Daily Traffic (ADT). The Treatment Injury Information resulted in a 0.0 percent change in Fatals, a 0.0 percent change for Class A, a 20.0 percent decrease for Class B, a 100.0 percent increase for Class C, and a 66.7 percent increase for Property Damage Only. The Target Injury Information resulted in a 0.0 percent change in Fatals, a 0.0 percent change for Class A, a 25.0 percent decrease for Class B, a 50.0 percent increase for Class C, and a 100.0 percent increase for Property Damage Only. The before period ADT year was 1998 and the after period ADT year was 2002.

Results and Discussion

The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 47.4 percent increase in Total Crashes and a 41.7 percent increase in Target Crashes. The summary results above demonstrate that the treatment location appears to have had an increase in the number of Total Crashes and an increase in the number of Target Crashes from the before to the after period.

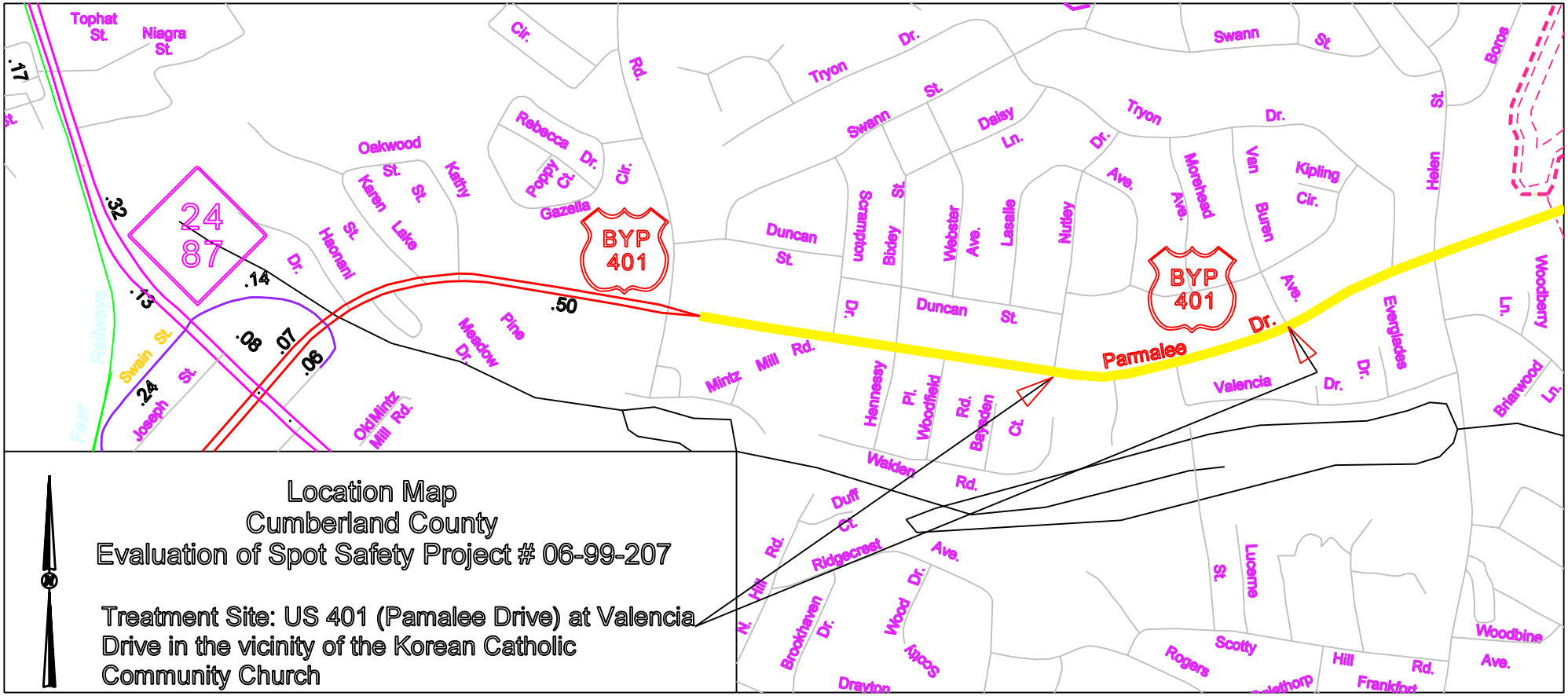
Referencing the collision diagram and table, the project was successful in completing its intended task of reducing the severity of ran off road crashes and keeping vehicles from driving over the embankment on the east side of US 401. The severity for embankment crashes for the before period was 18.6. In the after period, the severity for crashes into the guardrail is 3.7, that's an 80% reduction in severity. The guardrail did its intended function of containing 100% of the crashes that came in contact with it.

Referencing Table 2 and the collision diagrams, there is a small pattern of nighttime* crashes. In the photos it can be seen that there is one street lamp just after the curve, traveling north. Additional illumination before the curve may help bring focus to the existing chevrons, raise awareness of the curve and reduce the pattern of run off road crashes.

	Before	After	% reduction or increase
Ran off Road, right crashes	8	11	37.5
daytime	1	3	200.0
nighttime	7	8	14.3

Table 2. *Nighttime crashes include; dark-lighted roadway, dark-roadway not lighted, and dark-unknown lighting.

As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors for this type of road.



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Treatment Site Photos June 13, 2005

Driving North toward Van Buren Ave.

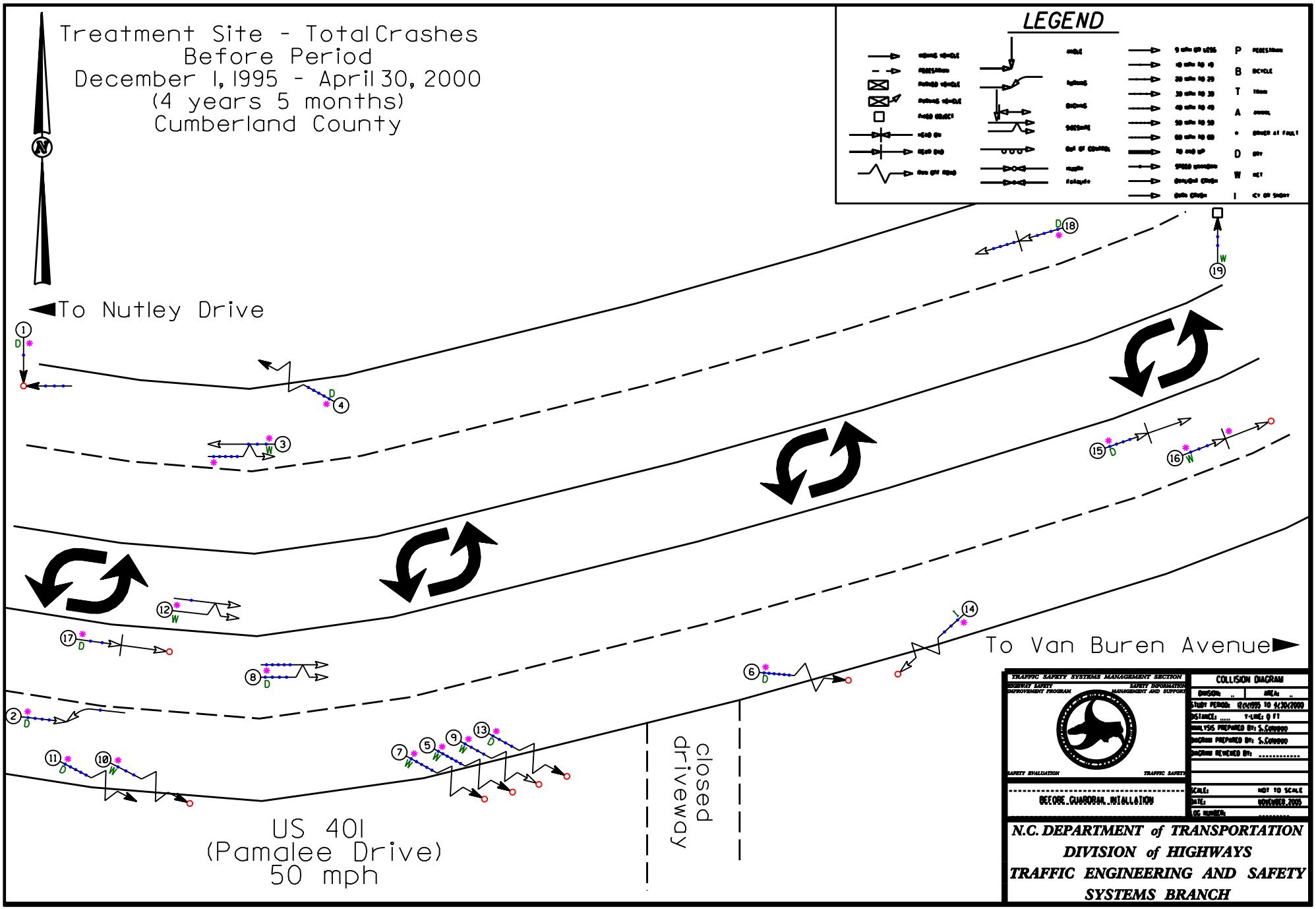
Driving North toward Van Buren Ave.

Embankment

Looking toward Nutley Dr.

Driving toward Nutley Dr.

Looking toward Van Buren Ave.



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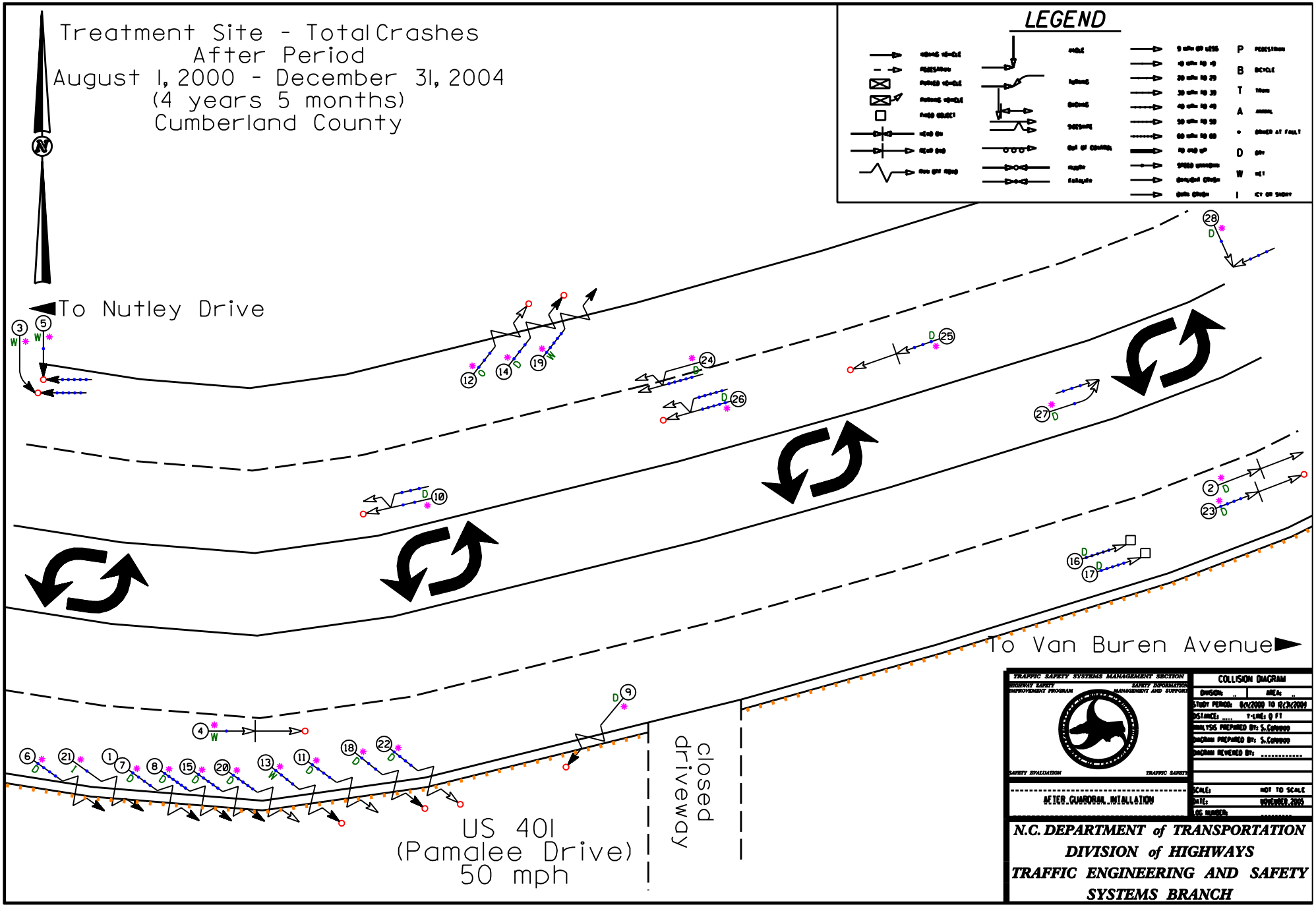

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